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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,158	01/31/2002	Alexander Govyadinov	10019410 -I	3575

7590 08/02/2004  
HEWLETT-PACKARD COMPANY  
Intellectual Property Administration  
P.O. Box 272400  
Fort Collins, CO 80527-2400

EXAMINER

WILLE, DOUGLAS A

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 08/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/066,158

Applicant(s)

GOVYADINOV ET AL.

Examiner

Douglas A Wille

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,9,13-16 and 19 is/are allowed.
- 6) ☒ Claim(s) 1,2,4-8,10-12,17,18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 -19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 1 refers to sheet resistance but it appears that resistivity is intended. It is also noted that the reference to sheet is not understood.
4. Claim 8 refers to the resistivity in the thickness direction as being larger than half the resistivity in the length and width directions and therefore the thickness resistivity can be larger than the transverse resistivity. Is this intended?
5. Claim 10 refers to the layer as being self organized. This is not understood and there is no support for a specific mechanism to create this self organization.
6. Claim 18 refers to the conductivity as being greater than that of the substrate. What direction of conductivity does this refer to?

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 1, 2, 4, 5, 12 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukamoto et al.
9. With respect to claim 1, Tsukamoto et al. show (see cover Figure and column 2, line 39 et seq.) an emitter with an electron source 11, a continuous anisotropic layer 17 and a cathode 17, 18, 19.
10. With respect to claim 2, the SiO<sub>2</sub> layer 11 is a tunneling layer.
11. With respect to claim 4, the structures 21 are equivalent to Spindt tips.
12. With respect to claim 5, the structures 21 are not on specific centers.
13. With respect to claim 12, the Tsukamoto et al. structures are poly (column 3, line 39).
14. With respect to claim 17, the Tsukamoto et al. device can be considered as being micropatterned

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto et al.
17. Tsukamoto et al. does not specify the efficiency but it would be obvious to design the device to produce high efficiency, specifically greater than 2%.
18. Claims 6, 8, 10, 11, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukamoto et al. in view of Kumar and Yamamoto et al.

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19. With respect to claims 6 and 16, Tsukamoto et al. show the basic device and Kumar show a similar device which uses Spindt tip like emitters of diamond (see cover Figure and column 4, line 30 et seq.). Yamamoto et al. show that for Spindt tip type devices either diamond or diamond like carbon can be used (column 3, line 14). It would have been obvious to use the diamond tips shown by Kumar in the Tsukamoto et al. device as a design alternative and to use diamond like carbon in place of diamond as a design alternative.

20. With respect to claim 8, the Kumar structure could have roughly equivalent resistance in the parallel and perpendicular directions. See also paragraph 18 above.

21. With respect to claim 10, the Kumar device is self organized in that no outside control is provided for the placement of the diamond emitters.

22. With respect to claim 11, Yamamoto et al. show an assembled array.

23. With respect to claim 18 Tsukamoto et al. do not specify the resistivities of the silicon films but it would be an obvious design tradeoff to select the relative resistivities to meet design objectives.

***Allowable Subject Matter***

24. Claims 3, 9, 13 – 16 and 19 are allowed.

***Response to Arguments***

25. Applicant's arguments filed 6/14/04 have been fully considered but they are not persuasive.

26. Applicant traverses the restriction requirement but since the requirement is proper it is made final.

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27. Applicant states that sheet resistance is defined as the resistivity divided by the thickness but since the claims refer to the sheet resistance as being anisotropic there is an inconsistency. With the above definition of sheet resistivity, it cannot be anisotropic.

28. With respect to self-organization, Applicant states that material such as polycrystalline material is self-organized. With that definition, it would appear that everything is self-organized. Thus self-organization is not supported.

29. Applicant states that Tsukamoto et al. do not show the claimed structure but note that the upper surface of 17 and 18, 19 are the cathode and that the layers 21,22 are the anisotropic conductivity layer. Thus Tsukamoto et al. show the claimed structure.

### ***Conclusion***

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

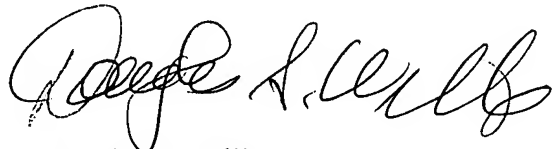
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas A Wille whose telephone number is (571) 272-1721.

The examiner can normally be reached on M-F (6:15-2:45).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Douglas A. Wille', is positioned above the printed name and title.

Douglas A. Wille  
Primary Examiner